



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/721,062

11/24/2003

Patrick W. Tandy

MCT.0046C1US

3265

(99-0200.02/

7590

07/21/2004

Trop, Pruner & Hu, P.C.

Suite 100

8554 Katy Freeway

Houston, TX 77024

EXAMINER

BROCK II, PAUL E

ART UNIT

PAPER NUMBER

2815

DATE MAILED: 07/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/721,062

Applicant(s)

TANDY, PATRICK W.

Examiner

Paul E Brock II

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 31-47 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 31-47 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 31 – 43 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard to claim 31, it is not clear how “the gold coating” can be thinner on the solder ball bond pads than on the wire bond bond pads when only one “a gold coating” has been defined. Are there two gold coatings being define? For purposes of this office action “a gold coating on said solder ball bond pads and on said wire bond bond pads” will be considered --a gold coating on the solder ball bond pads and another gold coating on the wire bond bond pads--.

3. Claim 32 recites the limitation "the gold" in the first line of the claim. There is insufficient antecedent basis for this limitation in the claim. For purposes of this office action “the gold” will be considered --the gold coating--.

4. With regard to claim 37, it is not clear how “the gold coating” can be thinner on the first bond pads than on the second bond pads when only one “a gold coating” has been defined. Are there two gold coatings being define? For purposes of this office action “a gold coating on said first and second bond pads” will be considered --a gold coating on the first bond pads and another gold coating on the second bond pads--.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 31 – 38, 41 – 44, 46 and 47 are rejected under 35 U.S.C. 102(b) as being anticipated by Haji et al. (JPPAT 11-067957, Haji¹).

Text citations are made to English translation document U.S. Patent 5909633 to Haji et al. (Haji²).

With regard to claim 31, Haji¹ discloses in figure 9a a packaged integrated circuit device. Haji¹ discloses in figures 4, 5, 7 and 9a a plurality of solder ball bond pads (88/16), the solder ball bond pads coupled to solder balls (90). Haji¹ discloses in figure figures 4, 5, 7 and 9a a plurality of wired bond pads (87/7), the wire bond bond pads coupled to bonding wires (15). Haji¹ discloses in figure 4, figure 5, figure 7, figure 9a, column 6, lines 9 – 13 and 31 – 50 a gold coating on the solder ball bond pads (62) and another gold coating on the wire bond bond pads (61), the gold coating on the solder ball bond pads being thinner than the gold coating on the wire bond bond pads.

With regard to claim 32, Haji¹ discloses in figure 4, figure 5, figure 7, figure 9a, column 6, lines 9 – 13 and 47 – 50 wherein the thickness of the gold on the solder ball bond pads is sufficiently low to reduce the likelihood of solder ball joint embrittlement.

With regard to claim 33, Haji¹ discloses in figure 4, figure 5, figure 7, figure 9a, column 6, lines 9 – 13 and 31 – 49 wherein the gold coating on the solder ball bond pads has a thickness of about 0.1 – 0.3 microns. It should be noted that 0.01 to 0.2 microns reads on the limitation of about 0.1 – 0.3 microns.

With regard to claim 34, Haji¹ discloses in figure 4, figure 5, figure 7, figure 9a, column 6, lines 9 – 13 and 31 – 50 wherein the gold coating on the solder ball bond pads has a thickness of about 0.25 microns. It should be noted that 0.2 microns reads on the limitation of about 0.25 microns.

With regard to claim 35, Haji¹ discloses in figure 5, figure 9a and column 5, lines 1 – 6 wherein the gold coating on the wire bond bond pads has a thickness of approximately 0.5 microns.

With regard to claim 36, Haji¹ discloses in figure 9a wherein the solder ball bond pads and the wire bond bond pads are all contained on the same planar surface (top of 41).

With regard to claim 37, Haji¹ discloses in figure 4, figure 9a, and column 5, lines 14 – 16 first (16) and second bond pad (14), the first and second bond pads comprising a nickel coated (22/25) metal (21/24). Haji¹ discloses in figure 4, figure 5, figure 7, figure 9a, column 6, lines 9 – 13 and 31 – 50 a gold coating (26) on the first bond pads and another gold coating (23) on the second bond pads, the gold coating on the first bond pad thinner than the gold coating on the second bond pad.

With regard to claim 38, Haji¹ discloses in figure 4, figure 9a and column 5, lines 11 – 12 wherein the first bond pad comprises a nickel coated copper.

With regard to claim 41, Haji¹ discloses in figure 4, figure 5, figure 7, figure 9a, column 6, lines 9 – 13 and 31 – 50 wherein the gold coating on the first bond pad has a thickness of between about 0.1 and 0.3 microns. It should be noted that 0.01 to 0.2 microns reads on the limitation of about 0.1 – 0.3 microns.

With regard to claim 42, Haji¹ discloses in figure 5, figure 9a and column 5, lines 1 – 6 wherein the gold coating on the second bond pads has a thickness of approximately 0.5 microns.

With regard to claim 43, Haji¹ discloses in figure 9a wherein the first and second bond pads coexist on a planar support structure (41).

With regard to claim 44, Haji¹ discloses in figure 7, figure 9a and column 6, lines 9 – 13 and 31 – 50 an intermediate structure for an integrated circuit device. Haji¹ discloses in figure 4, figure 5, figure 7, figure 9a, and column 5, lines 1 – 19 a first bond pad (16/44) comprising a gold coated (26) metal (24/25), the gold coating having a thickness of between about 0.1 and 0.5 microns. It should be noted that 0.2 to 1.0 microns reads on the limitation of about 0.1 – 0.5 microns. Haji¹ discloses in figure 4, figure 5, figure 7, figure 9a, column 5, lines 40 – 42, column 6, lines 9 – 13 and 31 – 50 a second bond pad (14) which is masked (19), the second bond pad comprising a nickel coated (22) metal (21).

With regard to claim 46, Haji¹ discloses in figure 4, figure 5, figure 7, figure 9a, column 6, lines 9 – 13 and 31 – 50 wherein the second bond pad comprises a nickel coated (22) copper (21).

With regard to claim 47, Haji¹ discloses in figure 9a wherein the first and second bond pads are the same planar surface (top of 41).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 39 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haji¹ as applied to claims 37, 38 and 44, respectively, above, and further in view of Thomas et al. (USPAT 5625734, Thomas).

With regard to claim 45, Haji¹ discloses in figure 4, figure 9a and column 5, lines 11 – 12 wherein the second bond pad comprises a nickel coated copper. Haji¹ is silent to the metal of the second bond pad being aluminum. Thomas discloses in column 3, lines 28 – 37 a second bond pad comprising aluminum. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the bond pad comprising aluminum of Thomas for the second bond pad of Haji¹ in order to use a material that is equivalent for the purpose of a bond pad.

With regard to claim 45, Haji¹ discloses in figure 4, figure 9a and column 5, lines 11 – 12 wherein the first bond pad comprises a nickel coated copper. Haji¹ is silent to the metal of the first bond pad being aluminum. Thomas discloses in column 3, lines 28 – 37 a first bond pad comprising aluminum. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the bond pad comprising aluminum of Thomas for the first bond pad of Haji¹ in order to use a material that is equivalent for the purpose of a bond pad.

9. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Haji¹ as applied to claim 37 above, and further in view of Watanabe et al. (JPPAT 05315731a, Watanabe).

Haji¹ discloses in figure 4 and figure 9a wherein the gold coating on the second bond pad is one gold coating. Haji¹ is silent to the gold coating on the second bond pad being a composite of two different gold coatings. Watanabe teaches in figure 1 wherein a gold coating (5 and 6) on a second bond pad (2) is a composite of two different gold coatings. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the two different gold coatings of Watanabe in the method of Haji¹ in order to decrease the defects in the top layer of a conduction pad as stated by Watanabe in the Abstract.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kano, Camilletti et al., and Thomas et al. all disclose gold bond pads.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul E Brock II whose telephone number is (571) 272-1723. The examiner can normally be reached on 8:30 AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2815

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Paul E Brock II

A handwritten signature in black ink, appearing to read "Paul E Brock II", written in a cursive style.